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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/280,385	03/29/1999	ELIYAHOU HARARI	HARI.006USW	5644

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EXAMINER

GOSSAGE, GLENN A

ART UNIT	PAPER NUMBER
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2187

9

DATE MAILED: 01/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.



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Patent and Trademark Office

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DATE MAILED:

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☒ Responsive to communication filed on 9-21-01 ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), \_\_\_\_\_ days from the date of this letter.  
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- |   |   |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input type="checkbox"/> Notice of Draftsman's Patent Drawing Review, PTO-948. |
| 3. <input type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449.                 | 4. <input type="checkbox"/> Notice of Informal Patent Application, PTO-152.       |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474.     | 6. <input type="checkbox"/> _____   |

Part II SUMMARY OF ACTION

1. ☒ Claims 63-66 are pending in the application.

Of the above, claims \_\_\_\_\_ are withdrawn from consideration.

2. ☒ Claims 1-62 have been cancelled.

3. ☐ Claims \_\_\_\_\_ are allowed.

4. ☒ Claims 63- are rejected.

5. ☐ Claims \_\_\_\_\_ are objected to.

6. ☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on \_\_\_\_\_. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on \_\_\_\_\_, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed \_\_\_\_\_, has been ☐ approved; ☐ disapproved (see explanation).

12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. \_\_\_\_\_; filed on \_\_\_\_\_.

13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

EXAMINER'S ACTION

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1. Applicant's request for declaration of an interference filed September 21, 2001 based on the proposed count filed September 21, 2001 has been considered. However, an interference is NOT being declared at this time since the patent claims, when read in light of the specification of which they are a part, are not directed to the same invention as the claims in the present application, i.e., the invention as set forth in the claims in the patent does not appear to be supported by the disclosure of the present application.

The "address conversion table" in the patent converts a logical sector address into a physical block number, where a block has a plurality of sectors and the "address conversion table" has a logical sector address storage section and a physical block number storage section (see column 5, lines 49-56 and claim 1, lines 3-5 and 8-11 of the patent, e.g.). The "unit of erasure" for the flash memory is a block, comprised of a plurality of sectors.

The "address conversion table" of the present invention is a "defect map table" (page 14, line 30) or "sector defect map" (page 23, line 33) which maps one sector address to another sector address. The "unit of erasure" for the flash memory is not a block, but a sector, and thus the "address conversion table" does not have a "physical block number storage section."

The "physical block number storage section" in the "address conversion table" of the patent stores arbitrary physical block numbers (see column 5, lines 64-66, e.g.) and, since block numbers are stored, a reduced capacity "address conversion table" may be used. The use of such an "address conversion table" including a logical sector address storage section and a physical block number storage section allows data to be stored on the physical block that is convenient for

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internal data management, regardless of the logical sector specified by the host (column 5, line 64 to column 6, line 2) and allows use of a reduced capacity "address conversion table" for memory management (column 4, lines 15-20 and column 6, lines 18-20, e.g.).

This is different from the "address conversion table" of the present claims in which the "address conversion table" ("sector defect map") maps one sector address to another sector address when, e.g., a sector is found to be defective. This allows defective sectors to be remapped by referring to the "address conversion table" which stores mapping information for converting one sector address to another sector address. [Note that the semiconductor disk device discussed in the prior art section of the patent (see Figure 14, e.g.) shows an "address conversion table" which converts a logical sector address to a physical sector address.]

If a match occurs in the "address conversion table" of the present invention, access to the requested sector (corresponding to the sector address input to the interface means, e.g.) is denied and a substitute sector is accessed (see page 23, line 31 to page 24, line 2, e.g.).

If a match occurs in the "address conversion table" of the patent, data in a corresponding memory area is read (see column 8, lines 47-58, e.g.).

Note also that although the response indicates that the claims of the patent were copied, applicants have also now admittedly broadened the claims by eliminating key features of the patent claims, including the use of an "address conversion table" for converting a logical sector address to a physical block number, the use of an "address conversion table" including a physical

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block number storage section, "means for converting" sector address information into a physical block number, and a "unit of erasure for the flash memory" being a block, where a block includes a plurality of sectors. [Applicants' claims in the present application appear to be more clearly analogous to the prior art discussed in the patent (Fig. 14, e.g.) showing an "address conversion table" for storing mapping information for converting one sector address into another sector address.]

For all of the above reasons, the claims of the present application do not appear to be directed to the same invention as that set forth in the claims of the patent, so that an interference is NOT being declared at this time.

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. A new title such as --Semiconductor Disk Device Including A Flash Memory And An Address Conversion Table For Converting Sector Address Information-- is suggested. Again, see claim 63, lines 1-2 and 6, e.g. The loss in brevity of title is more than offset by the gain in its informative value in indexing, classifying, searching, etc. See MPEP 606 and 606.01.

3. The abstract of the disclosure is objected to because the abstract contains underlining and bracketing (a "clean" copy of the abstract was not provided) which may cause possible confusion

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and printing delays, should this application issue into a patent. A clean copy of the abstract should be provided in accordance with 37 CFR 1.121.

Also, it appears the abstract should be amended using language similar to that used in claims 63-66, so that one is able to quickly determine from a cursory inspection the nature and gist of the technical disclosure. [For example, in line 8 (of the abstract on pages 3-4 of the response filed September 21, 2001), after "remapped" insert language such as --using a sector defect map or an address conversion/defect map table--. See claims 63 and 66, lines 6-11, e.g., and also note page 14, line 30 and page 23, line 33.]

Appropriate correction is required. See MPEP § 608.01(b).

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "logical sector address storage section" and "physical sector number storage section" of claim 65, must be shown or the features canceled from the claim. No new matter should be entered.

Note that while a sector defect map 409 is generally shown in Figure 5, the drawings do not appear to depict a "logical sector address storage section" and "physical sector number storage section" as claimed.

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5. It is once again noted that the disclosure has not been checked by the Examiner to the extent necessary to determine the presence of all possible minor errors. Applicants' cooperation is requested in correcting any errors of which applicant may become aware in the disclosure. The following objections are specifically noted:

**In the claims:**

In claim 66, the "whereby" clause in lines 4-5 is not entirely clear as the cause effect relationship is not readily apparent (e.g., the language "whereby data and addresses are exchanged" does not readily follow from the preceding claim language). It appears in line 4, "whereby" should be changed to --for exchanging-- and "are exchanged" deleted for clarity and consistency (see claim 63, lines 4-5, e.g.). In line 6, "comprising" appears to read more clearly here as --storing-- (note page 14, line 30, e.g.). In line 8, "connected" appears to read more clearly here as --coupled--. In lines 8 and 11, it appears --flash-- should be inserted before "memory" for consistency (note lines 2 and 3, as well as claim 63, line 12, e.g.). In line 9, it appears "whereby" reads more clearly here as --wherein--. In line 11, it appears "said identification" should be changed to --an (or --a corresponding--) identification stored in said sector map-- (in conjunction with the change suggested for line 6 above), or other similar language, for clarity. [Note that "said identification" as used here may have an unclear antecedent since there may be more than one "identification" (note claim 66, lines 6-7, e.g.).]

Appropriate correction is required.

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**In the specification:**

It is also noted here that the proposed amendment to "replace the paragraph between on page 1, line 23, and page 24, line 5" (response filed September 21, 2001 at page 2) has been made to replace the paragraph between page 11, line 23 and page 12, line 5 since this appears to be the intended amendment.

6. Claims 63-65 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 63, and therefore its dependent claims, the wording "a plurality of sectors, being a unit of erasure for the flash memory" is confusing as it is not readily apparent what the phrase "being a unit of erasure for the flash memory" refers here (a sector? a plurality of sectors? Note that the specification describes cells and sectors (a plurality of cells) as a "unit of erasure" for the flash memory. See page 9, lines 4-7 and 25-26 and page 15, lines 13-20, e.g. Should language such as -- , a sector-- be inserted before "being" (or "being" changed to --wherein a sector is-- for clarity and consistency? See claim 66, line 3, e.g.).

Also, it is not adequately clear to what the "address conversion table for converting" and the separate "means for converting ... and for accessing" refer in this instance, or how they are connected or related to each other and to the other elements or "means" set forth in the claim such as the "interface means."



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Applicants are again respectfully reminded that while 35 U.S.C. 112 sixth paragraph permits the use of "means plus function" language in a claim, this provision must always be considered as subordinate to the second paragraph of 35 U.S.C. 112 (see *In re Lundberg*, 244 F.2d at 547-548, 113 USPQ at 534 (CCPA 1979)). If one employs means plus function language in a claim, one must set forth an adequate disclosure showing what is meant by that language. If applicant fails to set forth such an adequate disclosure, applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112. See *In re Donaldson Company, Inc.*, 29 USPQ 2nd 1845 (Fed. Cir. 1994).

In the instant case, the language of the specification and claims is such that applicant has failed to provide an adequate disclosure showing to what the "means for converting ... and for accessing" refer in this instance. [For example, what does the actual "converting" here? Note that the claim sets forth that the address conversion table and the "means" are both "for converting."] The terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description (in this regard, see also 37 CFR 1.75(d)(1)).

Also, in line 10, the wording (address information) "input from the interface means from the external system" is confusing, particularly when read in conjunction with lines 6-7 (the address information is set forth as being input into the address conversion table from the external system and not "from the interface means"). Additionally, in line 11, the language "as identified by the address conversion table" is confusing here as the address conversion does not appear to

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“identify” a sector (note the language of 6-7, e.g., stating that the address conversion table “converts” address information while the physical sector number “identifies” a sector).

[The following changes are suggested to clarify or reconcile the language and terminology of claim 63 when the claim is read in light of the specification:

In claim 63, line 6, before “converting,” insert --for storing mapping information for-- and in line 7, change “into” to --to--.(see page 14, lines 30-31 and page 23, lines ,e g.). In line 10, delete “from the interface means” and in line 11, change “as identified by” to --, by referring to--.[In this regard, attention is respectfully directed to page 18, lines 29-31; page 23, lines 18-19; and page 23, line 31 to page 24, line 2, including page 23, lines 32-33.]

In claim 65, it is not entirely clear to what the “logical sector address storage section” and “physical sector number storage section” refer in this instance. Again, although a sector defect map 409 is generally shown in Figure 5, the specification does not appear to describe (nor do the drawings show) any “logical sector address storage section” and “physical sector number storage section” as presently claimed.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 63-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art (see page 8, lines 16-34 and page 14, line 13 to page 15, line 1 of the present specification, e.g.) in view of Yorimoto et al or Satoh et al, each taken separately.

With respect to claim 63, applicants' admitted prior art discloses a semiconductor "disk" device including a non-volatile, electrically programmable and erasable flash memory including a plurality of sectors, a sector being a unit of erasure for the flash memory. The semiconductor disk device includes some interface "means" for exchanging data and addresses with an external system. However, applicants' admitted prior art does not teach providing an "address conversion table" (sector defect map) for converting sector address information input from the external system into a physical sector number for identifying a sector of the plurality of sectors, and a "means" for converting the sector address information input from the interface means from the external system into the physical sector number by referring to the address conversion table, and accessing the flash memory according to the physical sector number.

Similarly with respect to claim 66, applicants' admitted prior art discloses a semiconductor "disk" device including a non-volatile, electrically programmable and erasable flash memory including a plurality of sectors, and an interface "means" for exchanging data and addresses with an external system. However, applicants' admitted prior art does not teach providing a "sector map" including an identification of each of the sectors and a respective alternate sector, and a

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controller operative upon receiving an address from the interface, for substituting access to a respective alternate sector.

Yorimoto et al or Satoh et al, each taken separately, also discloses a storage device including a plurality of sectors, and teaches providing defective sector substitution so as to allow for substitution of defective sectors. Yorimoto et al or Satoh et al, each taken separately, teaches providing an "address conversion table" or "sector defect map" for converting sector address information input from the external system and a "means" for converting the sector address information input from the external system into the physical sector number by referring to the address conversion table, and accessing the flash memory according to the physical sector number. Yorimoto et al or Satoh et al, each taken separately, teaches that access to defective sectors may be avoided by using the sector map, thereby providing more reliable data storage and retrieval and allowing the use of a storage device containing a small number of defective sectors, thereby improving yield and lowering overall cost. See column 1, line 67 to column 2, line 3; column 2, line 64 to column 3, line 5; column 5, lines 23+ of Yorimoto et al, and column 2, lines 25-32; column 2, line 64 to column 3, line 9; and column 4, lines 63-68 of Satoh et al, as well as page 14, line 20 to page 15, line 21 of the present specification. Note that while Satoh et al discusses an optical disk as the information recording and reproducing apparatus in a preferred embodiment, those of ordinary skill in the art would readily recognize that any storage device having a plurality of sectors may be used as the information recording and reproducing apparatus

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(note that the claims of Satoh et al broadly set forth an information recording and reproducing apparatus, e.g.).

Accordingly, it would have been readily obvious to a person of ordinary skill in the art at the time the claimed invention was made to provide for defective sector substitution by providing an "address conversion table" or "sector defect map" and a "means" for converting sector address information input from an external system into another ("physical") sector number by referring to the address conversion table or sector defect map, and accessing a storage device according to the physical sector number, as taught, for example, by Yorimoto et al or Satoh et al, each taken separately, in a storage device containing a plurality of sectors such as in applicants' admitted prior art, so as to avoid accessing defective sectors, thereby providing more reliable data storage and retrieval and allowing the use of a storage device containing a small number of defective sectors, thereby improving yield and lowering overall cost. The improvement in data reliability and device yield, and lowering of overall operating cost provide ample motivation and suggestion to utilize an "address conversion table" or sector defect map in the storage device of to arrive at a structure on which applicants claims read. Thus, the invention as set forth in the claims would have been obvious, within the meaning of 35 U.S.C. 103, in light of the combined teachings of the prior art.

With respect to claim 64, the input sector address information may be considered to include a "logical" sector address which is mapped or converted to a physical sector address on the storage

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device which is the sector actually being accessed (in place of the defective sector which was initially addressed).

With respect to claim 65, a “sector map” or “address conversion” table such as disclosed by Yorimoto et al or Satoh et al, each taken separately, may be considered to include a logical sector address storage section and a physical sector number storage section. The address of a defective sector is stored as a “logical” sector address while the corresponding alternate sector, to which the (defective) logical sector address is mapped, is stored as “physical” sector information.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sugimura et al is cited as disclosing an information recording and reproducing apparatus including “means” for substituting good sectors for defective ones using logical to physical address conversion.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the

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THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenn Gossage whose telephone number is (703) 305-3820.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Do Yoo, can be reached on (703) 308-4908.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.

The fax phone numbers for the organization where this application or proceeding is assigned are as follows:


(703) 746-7238

(After Final Communications)

(703) 746-7239

(Official Communications)

(703) 746-5713 (Use this FAX number only after approval by the Examiner, for "INFORMAL" or "DRAFT" communications. An Examiner may request that a formal paper/amendment be faxed directly to him or her on occasion.)



GLENN GOSSAGE  
PRIMARY EXAMINER  
ART UNIT 2187